USSR/Human and Animal Physiology - The Effect of Physical Factors. T
Ionizing Radiation.

Abs Jour : Ref Zhur Biol., No 3, 1959, 13376

of I produced a sharper drop in the sugar level than in the controls. The reaction to I in irradiated animals was not always accompanied by convulsions, even with a drop in the sugar level to 25 mg%. Injection of small doses of adrenaline to the irradiated animals called forth a more pronounced hyperglycemia than before radiation. Plotting of the sugar curves indicated that there was not such a sharp and rapid ascent of the sugar level in irradiated animals as in the non-radiated, but the return of the sugar content to normal occurred sooner. -- V.I. Rozengart

Card 2/2

ARUTYUNYAN, T.G.

Nature of the chemical link in the transmission of excitations over the conditioned reflex arc. Nauch.trudy Erev.un. 64: 19-24 '58. (MIRA 11:12)

1. Kafedra fiziologii cheloveka i zhivotnykh Yerevanskogo gosudarstvennogo universiteta.
(CHOLINE) (ATROPIN) (CEREBRAL CORTEX)

AKOPYAN, S.A.; BALASANYAN, M.I.; ANTONYAN, K.A.; PAPOYAN, S.A.; AVETYAN, S.G.; GASPARYAN, E.A.; PKHRIKYAN, Zh.A.; ARUTYUNYAN, T.G.

Immunobiological changes during septicopyemic processes in animals afflicted with radiation sickness. Izv. AN Arm. SSR. Biol. nauki 13 no.8:45-59 Ag '60. (MIRA 13:9)

1. Kafedra fiziologii cheloveka i zhivotnykh Yerevanskogo gosudarstvennogo universiteta, Nauchno-issledovatel'skiy institut perelivaniya krovi Ministerstva zdravookhraneniya Armyanskoy SSR i Nauchno-issledovatel'skiy institut rentgenologii i onkologii Akademii nauk Armyanskoy SSR.

(RADIATION SICKNESS) (SEPTICEMIA)
(LEUCOCYTES)

ARUTYUNYAN, U.G.

Determining optimal parameters of drainage systems. Sbor. nauch. trud. EPI 22:129-134 '64. (MIRA 18:12)

ARUTYUNYAN, V

Arkhitektura sovetskoy armenii; Kratkiy ocherk (Architecture of Soviet Armenia, by) V. N. Arutyunyan (I) K. L. Oganesyan. Yerevan, Akademkniga, 1955.

293 p. illus., diagrs.

At head of T.P.: Akademiya Nauk Armyanskoy, Yerivan. Sektor Istorii i Teorii Iskusstv.

Added T.P. in Armenian.

USSR/Farm Animals - Small Horned Stock Q

Abs Jour : Ref Zhur - Biol., No 15, 1958, 69344

Author : Zakharyan, G.P., Arutyunyan, V.A., Davtyan, G.G.

Inst : Armenian Scientific Research Institute of Animal Husbandry and Veterinary Medicine

Title : Utilization of Tobacco Stems as Feed for Farm Animals

Orig Pub : Tr. Arm. n.-i. in-ta zhivotnovodstva i veterinarii, 1957, 2, 143-152

Abstract : It was established that tobacco stems by their chemical composition are close to basic silage crops and ensile well. Feeding them to pregnant and nursing ewes, 1-1.5 kg per head, daily, had no harmful effect. The content of alkaloids in the silage diminished 2-2.5 times as compared with initial raw material, and the treatment of silage with carbide slime reduces their content 3-7 times.

Card 1/1

ARUTYUNYAN, V.A.(Nagorno-Karabakhskaya avtonomnaya oblast')

Anastasiia Stepanovna Severina, Med. sestra 16 no.3:29 Mr '57
(MLRA 10:5)
(SEVERINA, ANASTASIIA STEPANOVNA, 1895-)

ARUTYUNYAN, V.B.

Leila Tagievna Alieva. Med. sestra 15 no.11:23 N '56. (MLRA 9:12)

1. Predsedatel' abkoma profsoyuza meditsinskikh rabotnikov Nagorno-Karabakhskoy avtonomnoy oblasti, Stepanokert.
(ALIEVA, LEILA TAGIEVNA)

32502
S/044/61/000/011/025/049
C111/C444

16.4100

AUTHORS: Arutyunyan, V. M; Muradyan, R. M.

TITLE: Asymptotic formulas for the Jacobi functions of first and second kind

PERIODICAL: Referativnyy zhurnal, Matematika, no. 11, 1961, 57, abstract 11B296. (Nauchn. dokl. vyssh. shkoly Fiz.-matem. n. 1958, no. 3, 8 - 13)

TEXT: For high values of l and $0 \leq x < \pi$, one derives asymptotic formulas for the Jacobi functions of first kind $P_l^{(\alpha,\beta)}$ and of second kind $Q_l^{(\alpha,\beta)}$;

e. g.

$$P_l^{(\alpha,\beta)}(\cos x) = \frac{\Gamma(l+\alpha+1)}{\Gamma(l+1)\,[l+(\alpha+\beta+1)/2]^{\alpha}} \left(\frac{x}{\sin x}\right)^{1/2} \times$$
$$\times \frac{1}{[\sin(x/2)]^{\alpha}\,[\cos(x/2)]^{\beta}} J_{\alpha}\left(\left(l+\frac{\alpha+\beta+1}{2}\right)x\right),$$
$$Q_l^{(\alpha,\beta)}(\cos x) = -\frac{\pi}{2} \frac{\cos \alpha\pi\,\Gamma(l+\beta+1)\,[l+(\alpha+\beta+1)/2]^{\alpha}}{\Gamma(l+\alpha+\beta+1)} \times$$
$$\times \left(\frac{x}{\sin x}\right)^{1/2} \frac{1}{[\sin(x/2)]^{\alpha}\,[\cos(x/2)]^{\beta}} \times$$
$$\times N_{\alpha}\left(\left(l+\frac{\alpha+\beta+1}{2}\right)x\right),$$

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32502
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C111/C444

Asymptotic formulas for the Jacobi....

J_α, $N_\alpha(x)$ being the Bessel functions of first respectively second kind. Analogous formulas are obtained for $P_1^{(\alpha,\beta)}(\mathrm{ch}x)$ and $Q_1^{(\alpha,\beta)}(\mathrm{ch}x)$.

[Abstracter's note: Complete translation.]

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SCV/20-122-5-1/56

AUTHORS: Arutyunyan, V.M., Muradyan, R.M., and Sokolov, A.A.

TITLE: Asymptotic Expression for the Degenerated Hypergeometric Function (Asimptoticheskoye vyrazheniye dlya vyrozhdennoy gipergeometricheskoy funktsii)

PERIODICAL: Doklady Akademii nauk, SSSR, 1958, Vol 122, Nr 5, pp 751-754 (USSR)

ABSTRACT: The author studies the asymptotic behavior of the solutions of a differential equation of the form

$$u'' + f(x)u = 0 \qquad (1)$$

by constructing a "neighboring equation." The solution of equation (1) is sought in the form

$$u = \varphi(x)\, F[z(x)] \qquad (2)$$

where φ, F and z are arbitrary functions. Substituting (2) in (1), the asymptotic expression

$$u = (z/z')^{\frac{1}{2}} \left\{ AZ_s^{(1)} \quad BZ_s^{(2)} \right\} (z) \qquad (4)$$

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Asymptotic Expression for the Degenerated Hypergeometric Function

SOV/20-122-5-1/56

is obtained, where $Z_s^{(1)}$ and $Z_s^{(2)}$ are two linearly independent solutions of the Bessel equation and A and B are constants. The results are applied by the author to the location of asymptotic formulas for Whittaker's degenerate hypergeometric function $W_{\eta,\mu}(x)$ and to such special cases of this function as Hermitian and LAguerre polynomials and the Bessel function, and also to the derivation of Kilb's asymptotic formula. There are 7 references, 4 of which are Soviet, 2 American, and 1 German.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova (Moscow State University imeni M.V. Lomonosov)

PRESENTED: June 2, 1958, by N.N. Bogoljubov, Academician

SUBMITTED: May 23, 1958

Card 2/2

S/055/59/000/04/006/026
B014/B005

AUTHORS: Sokolov, A. A., Muradyan, R. M., Arutyunyan, V. M.

TITLE: Development of the WKB Method of Approximation

PERIODICAL: Vestnik Moskovskogo universiteta. Seriya matematiki, mekhaniki, astronomii, fiziki, khimii, 1959, Nr 4, pp 61 - 78 (USSR)

ABSTRACT: In mathematical physics, special functions which are exact solutions of differential equations are often approximated by simpler functions. The authors mention the method by Liouville-Steklov (Ref 1) for differential equations of second order, and then explain the method of approximation suggested by Wentzel, Kramers and Brillouin (Ref 3) (WKB method) for the solution of the wave equation. In this method, already the first approximation gives good results. In the present paper, this method is put forward in a generalized form. Besides, better approximated solutions are derived for a number of cases by finding the solution of a differential equation "neighboring" the original differential equation. In the first principal part of the present paper, the solutions (2,11) and (2,12) are obtained by the WKB method starting from the linear differential equation of second order $u'' + f(x)u = 0$ (2,2). The first solution

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holds for $f(x)>0$, the second one for $f(x)<0$. The authors point out that many problems of quantum mechanics can be solved by the method put forward here. This method gives no result near the point $x = x_0$ where $f(x_0) = 0$. Here, the required function is not approximated by harmonic functions as in the first case nor by exponential functions as in the second case, but by Bessel functions. In the second principal part, asymptotic formulas for regular hypergeometric functions are derived. The spherical functions are dealt with first. The authors proceed from the Legendre functions (3,1) and (3,2), and write down the four solutions (3,3) and (3,4). From the latter, the known asymptotic formulas for the Legendre functions (3,20) and (3,21) are derived by the above-mentioned method. The application of these functions is shown by a treatment of the elastic scattering of particles in a Yukawa potential. Further, the approximate formulas for the Jacobi functions of first and second type, and for the Gegenbauer functions are derived. There are 1 figure and 16 references, 10 of which are Soviet.

ASSOCIATION: Kafedra statisticheskoy fiziki i mekhaniki (Chair of Statistical Physics and Mechanics)

Development of the WKB Method of Approximation

S/055/59/000/04/006/026
B014/B005

SUBMITTED: April 9, 1959

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S/055/59/000/06/07/027
B006/B005

AUTHORS: Sokolov, A. A., Muradyan, R. M., Arutyunyan, V. M.

TITLE: Development of an Approximate WKB Method

PERIODICAL: Vestnik Moskovskogo universiteta. Seriya matematiki, mekhaniki, astronomii, fiziki, khimii, 1959, No. 6, pp. 64 - 86

TEXT: The present paper continues the first part published in "Vestnik Moskovskogo universiteta", 1959, No. 4, p. 61. It begins with § 4 dealing with the confluent hypergeometric function and deals at first with the Whittaker function. The formulas derived are subsequently applied to a concrete case: the investigation of the emission of an electron moving at ultrarelativistic velocity in a constant, homogeneous magnetic field. The problem is schematically shown by Fig. 1; Fig. 2 shows the dependence of radiation intensity on the number of harmonics. The subsequent chapters deal with the Laguerre and Hermite polynomials, the quantum correction in the theory of "radiating" electrons, and the determination of eigenvalues (the approximate method developed here does not only permit a derivation of asymptotic expressions for wave functions but also a determination of eigenvalues of the parameter λ - cf. Part I). The paper

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Development of an Approximate WKB Method

S/055/59/000/06/07/027
B006/B005

concludes with a comparison of the asymptotic formulas with the accurate formulas within the range of relatively small quantum numbers. (Abstracter's Note: Without knowing the first part of the paper it is not possible to follow the course of calculation, all the more so as all definitions necessary are missing.) There are 5 figures and 11 references, 9 of which are Soviet.

ASSOCIATION: Kafedra statisticheskoy fiziki i mekhaniki (Chair of Statistical Physics and Mechanics)

SUBMITTED: April 9, 1959

Card 2/2

24(5) SOV/56-36-2-37/63

AUTHORS: Sokolov, A. A., Arutyunyan, V. M., Muradyan, R. M.

TITLE: The Calculation of the Phases of Scattering Taking into Account the Second Approximation (Vychisleniye faz rasseyaniya s uchetom vtorogo priblizheniya)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 2, pp 594 - 599 (USSR)

ABSTRACT: In the present paper the authors calculate the phase shifts of the elastic scattering of Dirac (Dirak) particles in second approximation with respect to the interaction potential. An expression is given for the general solution of the free Dirac equation of this problem. This solution is not limited by a condition of finiteness in the origin of coordinates. This solution of the free equation is also an asymptotic expression for the Dirac equation if there exists a spherically symmetric short-range force center. The next part of the paper gives an approximate solution of the Dirac equation for the case of a central field. An integral equation equivalent to the Dirac equation is given for the case in

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The Calculation of the Phases of Scattering Taking into Account the Second Approximation

SOV/56-36-2-37/63

which there is no vector potential and the scalar potential is spherically symmetric. The interaction energy is considered as a perturbation and the calculations are carried out in second approximation; the wave function corresponding to this approximation is given explicitly. The calculations are discussed step by step and the expressions found for the phase shifts are given explicitly. Neglecting the terms which are square with respect to V(r), one obtains the same results as in the theory of damping for the scattering of Dirac particles. For small values of the scattering phases, the results of the first Born approximation are obtained. The results of this paper may be used also for the investigation of the scattering by a Coulomb (Kulon) center, ($V(r)=-Ze^2/r$). The integral values of the phase shifts diverge in this case, but correct results are nevertheless found. Finally, expressions are given for the scattering amplitudes (in second approximation) and for the differential cross section. There are 4 references, 2 of which are Soviet.

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The Calculation of the Phases of Scattering Taking into Account the Second Approximation SOV/56-36-2-37/63

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: August 26, 1958

Card 3/3

24(5)

AUTHORS: Arutyunyan, V. M., Muradyan, R. M. SOV/56-36-5-38/76

TITLE: The Scattering of Dirac Particles in the Second Born Approximation (Rasseyaniye dirakovskikh chastits vo vtorom bornovskom priblizhenii)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 5, pp 1542-1545 (USSR)

ABSTRACT: The present paper is a continuation of an earlier paper by the same authors (Ref 1), which they wrote in collaboration with A. A. Sokolov; in the latter the scattering phases $\delta_1^{(1)}$ and $\delta_1^{(2)}$ of Dirac particles on arbitrary centers of force have been calculated in second approximation with respect to interaction. In the present paper the authors carry out a short investigation of the elastic scattering of Dirac particles by the spherically-symmetric field of a fixed center. On the supposition that the phase shifts are small, i.e. that $tg\delta_l \approx \delta_l$, formulas are first given for the scattering amplitudes $f(\vartheta)$ and $g(\vartheta)$ in linear approximation, which are then further transformed by using the results obtained in reference 1. In the following, the case of high energies, when it is possible, in the Dirac equation,

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to neglect the rest mass of the particles in comparison to their total energy, is investigated. It may be shown that, if the rest mass is neglected, the phase shifts, in accordance with the given total angular momentum, coincide exactly, i.e. $\delta_l^{(1)} = \delta_{l+1}^{(1)}$.

The authors thank Professor A. A. Sokolov for supervising the work carried out. There are 2 references, 1 of which is Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: December 2, 1958

85686

S/056/60/038/006/028/049/XX
B006/B070

24.6520

AUTHORS: Kerimov, B. K., Arutyunyan, V. M.

TITLE: Polarization of Electrons in Elastic Scattering Taking Into Account the Finite Dimensions of the Nucleus

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 38, No. 6, pp. 1798-1802

TEXT: The object of the present work was to calculate the scattering phase shifts and the polarization of elastically scattered electrons when allowance is made for the finite size of the scattering center. It is known that when a partially polarized electron beam is scattered by nuclei, the angular distribution has an azimuthal asymmetry. As Mott has shown, such an effect can appear on double scattering of an electron at a point center. This effect has been observed experimentally many times but only for low energies where the electron wavelength is large compared to the dimensions of the nucleus which may then be considered as a point scatterer. It may be expected that for large electron energies, the

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Polarization of Electrons in Elastic Scattering Taking Into Account the Finite Dimensions of the Nucleus

S/056/60/038/006/028/049/XX
B006/B070

structural peculiarities of a nucleus of finite size would affect the azimuthal asymmetry considerably. An expression for the azimuthal asymmetry on double scattering is derived in this paper, and corrections are given to the usual Mott formula for the second and fourth nuclear charge density moments. The azimuthal asymmetry, δ_2, on double scattering through the angles θ_1, θ_2 is characterized by $\delta(\theta_1\ \theta_2) = 2\Delta(\theta_1)\Delta(\theta_2)$; $\Delta(\theta) = i(fg^* - f^*g)/(ff^* + gg^*)$, where f and g are the Dirac scattering amplitudes. In first approximation $\Delta(\theta) = 0$; in second approximation formula (10) is obtained. As is seen from this formula, the nuclear dimensions affect the polarization properties of the electron beam for large energies. For energies of 50 - 100 Mev, (10) may be simplified to (14): $\Delta(\theta) = \Delta^T(\theta)\left[1 + \frac{2}{3}k^2\langle r^2\rangle\left(\sin^2\frac{\theta}{2} + \frac{\cos^2(\theta/2)}{\ln\sin(\theta/2)}\right)\right]$. As an example, an estimate of the effects due to the finite dimensions of the C^{12} nucleus is given. The moments of second and fourth order are found to

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Polarization of Electrons in Elastic Scattering Taking Into Account the Finite Dimensions of the Nucleus

S/056/60/038/006/028/049/XX
B006/B070

be $\langle r^2 \rangle = 5.790 \cdot 10^{-26}$ cm^2 and $\langle r^4 \rangle = 5.061 \cdot 10^{-51}$ cm^4. The diagram shows Δ/Δ^T as a function of the scattering angle for the following electron energies: 1 - 100, 2 - 200, 3 - 300, and 4 - 400 $m_o c^2$. A. A. Sokolov is thanked for discussions. R. M. Muradyan is mentioned. There are 1 figure and 11 references: 5 Soviet, 2 US, 2 British, 1 Dutch, and 1 Japanese.

IX

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: January 3, 1960

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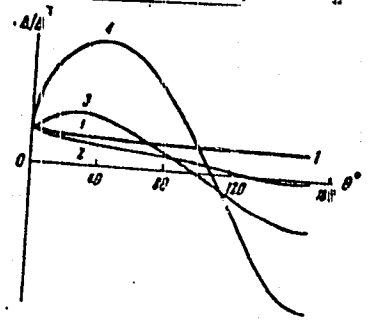
85688

Polarization of Electrons in Elastic Scattering Taking Into Account the Finite Dimensions of the Nucleus

S/056/60/038/006/028/049/XX
B006/B070

$$\Delta(\theta) = \Delta^{T}(\theta)\left[1 + \frac{2}{3}\sin^2\frac{\theta}{2}\left(k^2\langle r^2\rangle + \frac{2}{3}k^4\langle r^2\rangle^2\sin^2\frac{\theta}{2} - \right.\right.$$
$$\left.\left. - \frac{1}{5}k^4\langle r^4\rangle\sin^2\frac{\theta}{2}\right) + \frac{1}{3}\frac{\cos^2(\theta/2)}{\ln\sin(\theta/2)}\left(2k^2\langle r^2\rangle + \frac{4}{3}k^4\langle r^2\rangle^2\sin^2\frac{\theta}{2} - \right.\right.$$
$$\left.\left. - \frac{1}{3}k^4\langle r^2\rangle^2 - \frac{1}{5}k^4\langle r^4\rangle - \frac{1}{5}k^4\langle r^4\rangle\sin^2\frac{\theta}{2}\right)\right], \qquad (10)$$

$$\Delta^{T}(\theta) = \frac{2Z}{137}\frac{\alpha^{-1}(1-v^2/c^2)^{1/2}}{1-v^2c^{-2}\sin^2(\theta/2)}\frac{\sin^2(\theta/2)}{\cos(\theta/2)}\ln\sin\frac{\theta}{2} \qquad (11)$$



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32390
S/022/61/014/006/001/004
D299/D301

24,7200 (1153, 1140)

AUTHOR: Arutyunyan, V. M.

TITLE: On electron polarization in elastic scattering by nuclei .

PERIODICAL: Akademiya nauk Armyanskoy SSR. Izvestiya. v. 14, no. 6, 1961, 93-98

TEXT: In computing azimuthal asymmetry, the following effects were taken into account: Screening of the nuclear charge by electrons, the structural peculiarities of the nucleus and radiation corrections to Mott's formula. Electron scattering is considered in the second Born approximation. Thereby, the polarization of electrons is expressed by

$$\Delta(\theta) = \Delta^{\Gamma}(\theta)\,\frac{\sin^2\theta/2\; J_1 - 2J_2}{8\,F(\theta)\,\ln\sin\theta/2} \qquad (2.3)$$

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On electron polarization ...

where

$$J_k = \int \frac{\sin\varphi \sin\psi F(p) F(\psi)}{\sqrt{1-\cos^2\varphi-\cos^2\psi-\cos^2\theta+2\cos\varphi\cos\psi\cos\theta}} \times$$

$$\times \frac{d\varphi d\psi}{\sin^2\varphi/2\,(\sin^2\psi/2)^{2-k}}.$$

By this formula, the azimuthal asymmetry can be readily calculated for various charge-density distributions. In deriving formula (2.3) the interactior potential was not specified, hence the screening effects, as well as the size of the nucleus can be taken into account. Screening effect: With small energies, the theoretical and experimental results disagree by about 50%. As a rule, theory predicts greater asymmetry than that resulting from experiment. Apparently, the radiation corrections are substantial for higher Born approximations, but a theoretical evaluation of effects of such high order is very difficult. Polarization effects for μ-mesons: For small energies, the polarization is expressed by formula

On electron polarization ...

$$\Delta(\theta) = \Delta^{T}(\theta)\left\{1 + \frac{2}{3}k^2\langle r^2\rangle\left(\sin^2\frac{\theta}{2} + \frac{\cos^2\theta/2}{\ln\sin\theta/2}\right)\right\} \qquad (5.1)$$

where $\langle r^2\rangle$ is the mean square nuclear radius. With large energies, such a simple result cannot be obtained. The author considers it advisable to carry out independent experiments on the scattering of polarized μ-mesons (so as to further elucidate μ-meson interaction). The comparatively high degree of asymmetry in Mott scattering makes this method particularly suitable for measuring electron polarization. According to the two-component neutrino theory, the electrons emitted by ß-decay should have longitudinal polarization. The experiments confirm the calculated value of polarization with an accuracy of 15-20%. Such deviations may be due to systematic experimental error. Some deviations could apparently be attributed to inaccurate theoretical values of the function $\Delta(\theta)$. The experimentally observed large deviations from the calculated values (for small energies), cannot be explained by screening or radiation

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On electron polarization ...

corrections. It seems that large systematic errors occur in the experiments, due to inelastic scattering of electrons. The deviations may be due to the depolarizing effect of exchange scattering on electrons. The experiments give no clue as to the direction in which the theoretical results should be corrected. The author expresses his thanks to M. L. Ter-Mikayelyan. There are 1 figure and 4 references: 1 Soviet-bloc and 3 non-Soviet-bloc. The references to the English-language publications read as follows: N. Sherman, Coulomb scattering of relativistic /-electrons?-/ by point nuclei. Phys. Rev., 103, 1601, 1956; N. Ryu, Polarization of electrons by scattering. J. Phys. Japan, 7, 125, 130, 1952; C. B. O. Mohr and L. J. Tassie, The scattering and polarization of electrons by gold, Proc. Phys. Soc., A 67, 711, 1954.

ASSOCIATION: Fizicheskiy institut AN Armyanskoy SSR (Institute of Physics, AS ArmSSR)

SUBMITTED: June 22, 1961

Card 4/4

ARUTYUNAYAN, V.M.; VARTANYAN, Yu.L.; CHUMARYAN, E.V.; SHAKHBAZYAN, V.A.; AMATUNI, A.TS.; DZHRBASHYAN, V.A.; MELIK-BARKHUDAROV, T.K.; TEVIKYAN, R.V.; BERESTETSKIY, V.B., prof., red.; SHTIBEN, R.A., red. izd-va; KAPLANYAN, M.A., tekhn. red.

[Problems in the theory of strong and weak interactions of elementary particles; lectures] Voprosy teorii sil'nykh i slabykh vzaimodeistvii elementarnykh chastits; lektsii. Pod obshchei red. V.B.Berestetskogo. Erevan, Izd-vo Akad. nauk Armianskoi DDR, 1962. 190 p. (MIRA 15:5)

1. Akademiya nauk Armyanskoy SSR. Fizicheskiy institut.
(Nuclear reactions)

3785h

S/022/62/015/003/005/008
D234/D308

AUTHOR: Arutyunyan, V.M.

TITLE: Photoproduction of π and K mesons

PERIODICAL: Akademiya nauk Armyanskoy SSR. Izvestiya, v.15, no.3, 1962, 85-98

TEXT: The author considers (mainly on the basis of the theory of peripheral interactions): 1) photoproduction of π^0 mesons at high energies and in the domain of small angles, showing that in this case a diagram with single-photon intermediate state gives the main contribution; the so-called Primakoff effect on nucleon is discussed and an analogous mechanism of 'bipion' and 'tripion' production is discussed; 2) photoproduction of π^+ mesons on a proton in polar approximation, in the same domain as before; the results are compared with experiments; 3) photoproduction of ΛK and ΣK particles, assuming predominant contribution of K' resonance near the threshold, with different variants of relative parity of proton

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and Λ hyperon, satisfactory agreement with experiments is found in case of opposite relative parity. The author expresses his gratitude to K.A. Ter-Martirosyan, M.L. Ter-Nikayelyan, Yu.L. Vartanyan, E.V. Chubaryan and V.A. Tumanyan for discussion. There are 11 figures.

ASSOCIATION: Fizicheskiy institut AN Armyanskoy SSR (Institute of Physics, AS ArmSSR)

SUBMITTED: January 21, 1962

40805

24.6610

S/022/62/015/004/003/003
1028/1228

AUTHORS: Arutyunyan, V. M., and Chubaryan, E. V.

TITLE: About the reaction $\pi^- + p \rightarrow n + e^+ + e^-$

PERIODICAL: Akademiya nauk Armyanskoi SSR. Izvestiya. Seriya fiziko-matematicheskikh nauk. v. 15, no. 4, 1962, 81-83

TEXT: The cross-section of the considered reaction is expressed by the cross-section $\sigma_{ee}(w)$ of the process

$$\pi^- + \pi^+ \rightarrow e^- + e^+ \qquad (4)$$

It is assumed that a $\pi - \pi$ resonance exists, which is allowed for phenomenologically by the introduction of the vector mesonic field $B_\mu^{(1)}(x)$. An expression is obtained for $\sigma_{ee}(w)$, and it is established that it has a resonance corresponding to the resonance of the $\pi - \pi$ system. There are 4 figures. The most important English-language reference reads as follows: Chew, G. F., F E. Low. Unstable particles as Targets in Scattering Experiments. Phys. Rev. 113, 1640., 1958.

ASSOCIATION: Fizicheskiy institut AN Armyanskoy SSR, Erevanskii gosudarstvennyy universitet (Institute of Physics of the Academy of Science of the Armenian SSR, Erevan state university)

SUBMITTED: January 22, 1962

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24.6700

37115
S/056/62/042/004/031/037
B125/B102

AUTHOR: Arutyunyan, V. M.

TITLE: Photoproduction of π^0-mesons at high energies

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 4, 1962, 1112-1114

TEXT: The formula of H. Primakoff (Phys. Rev., 81, 899, 1951) for the angular meson distribution during photoproduction in the nuclear Coulomb field cannot be used for photoproduction on a nucleon at high energies since recoil is not considered. The matrix element

$$M = -i(2\pi)^4\delta(p_1 + k - p_2 - q)\frac{e\Lambda}{2(k\omega)^{1/2}t}\varepsilon_{\mu\nu\sigma\rho}q_\nu e_\sigma k_\rho \bar{u}(p_2)\Gamma_\mu u(p_1), \quad (2)$$

$$\Gamma_\mu = [F_1(t) + F_2(t)]\gamma_\mu + \frac{i}{2M}F_2(t)(p_1 + p_2)_\mu.$$

for the photoproduction of neutral pions on protons (see graph) gives the differential cross section distribution

Card 1/4

Photoproduction of π^0-mesons ...

$$\frac{d\sigma(0)}{d\Omega} = \frac{1}{137}\frac{\Lambda^2}{16\pi}\frac{kq^2}{W^2\mu^2}\left\{t\cos^2\theta\,[F_1(t)+F_2(t)]^2 + \right.$$
$$\left. + W^2\sin^2\theta\left[2F_1^2(t)+\frac{t}{2}F_2^2(t)\right]\right\}. \qquad (3)$$

in the center-of-mass system. All energy factors can be expressed in terms of nucleon masses. F_1 and F_2 are the electromagnetic form factors of the proton, Λ the form factor of the π^0-meson, e_σ the polarization vector of the photon, $\varepsilon_{\mu\nu\sigma\varrho}$ the antisymmetric tensor of the fourth rank, $t = (q - k)^2$ the square transferred momentum, μ and M the meson and nucleon masses, k, ω, and E the photon, meson, and nucleon energies, W the total energy of the colliding particles. The graph delivers a large contribution only for small angles $\theta^2 \approx t_0/kq$, and $d\sigma(0)/d\Omega \approx 0.5\cdot10^{-30}k^6$ cm^2/steradian holds for photoproduction in the forward direction. The electromagnetic form factors, $F_{1,2}(t_0)$ of the proton can be replaced by their values at t = 0. In contrast to Primakoff's results, the cross section increases very rapidly with the energy of the incident photon. $d\sigma(\theta)/d\Omega$ has a maximum at small angles. The part of the photoproduction cross section which is characterized by

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Photoproduction of π^0-mesons ...

interference of the graph with the other pole graphs is expressed by

$$\frac{d\sigma_3(0)}{d\Omega} = \frac{1}{137}\frac{G\Lambda}{16\pi}\frac{q(qk)}{k^2W^2(p_2k)}\left\{(1+\mu_p)\left[M(qk)^2(F_1+F_2)+\right.\right.$$
$$\left.\left.+2W^2k^2\frac{q^2}{M^2}\sin^2\theta\cdot F_2\right]-2\mu_p k^2W^2q^2\sin^2\theta(F_1+F_2)\right\}, \quad (6),$$

where $G^2/4\pi = g^2 \approx 15$. For forward photoproduction, the interference part of the cross section is of the order of 10^{-33} M^2/W^2 cm^2/steradian; it cannot compete with the main effect at high energies. K. A. Ter-Martirosyan and Yu. L. Vartanyan are thanked for a discussion. There is 1 figure. The English-language references read as follows: V. Glaser, R. Ferrell. Phys. Rev., 121, 886, 1961; A. V. Tollestrup, S. Berman, R. Comez, H. Ruderman. Proc. 1960 Ann. Intern. Conf. on high energy Physics at Rochester, Publ. Univ. Rochester, 1961.

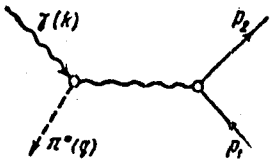
ASSOCIATION: Fizicheskiy institut Akademii nauk Armyanskoy SSR (Physics Institute of the Academy of Sciences Armyanskaya SSR)

SUBMITTED: November 15, 1961

Card 3/4

Photoproduction of π^0-mesons ...

Figure



Card 4/4

B/056/62/043/005/051/058
B125/B104

AUTHOR: Arutyunyan, V. M.

TITLE: Strange particle photoproduction

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43, no. 5(11), 1962, 1964-1966

TEXT: The ΛK production in the reaction $\gamma+p \longrightarrow \Lambda^0 + K$ is investigated in approximation of a K^*-particle exchange and is compared with the experimental result of the strange particle photoproduction near the threshold. For simplicity, the isotopic relations are neglected. K^* is assumed to be a spatial vector. Also the radiation corrections to the vertex operators of the Green's functions are not considered. The angular distribution

$$\frac{d\sigma(0)}{d\Omega} = \frac{(\Lambda_1\Lambda_2)^2}{32\pi^2}\frac{kq^2}{(t+m^2)^2}\left\{\sin^2\theta + \frac{1}{2W^2}\cos^2\theta\left[t+(M_\Lambda - P_{\Lambda p}M_p)^2\right]\right\}. \quad (2)$$

of the K^+-particles in c.m.s. determined in this approximation agrees with

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Strange particle photoproduction

experimental data for $P_{\Lambda p} = -1$. It holds that $t = 2k(\omega - q\cos\theta) - \mu^2$; k is the momentum of the photon; q, ω and μ are momentum, energy and mass of the K-meson; W is the total energy of the reaction, M_Λ, M_p and m are the masses of the hyperons, the protons and the K^*-mesons. Λ_1 is the constant of the $\Lambda K^* p$-interaction, Λ_2 is the constant of the $\gamma K^* K$-interaction. For $P_{\Lambda p} = 1$ this angular distribution is proportional to $\sin^2\theta$. $P_{\Lambda p}$ is the relative parity in the $\Lambda K^* p$ vertex. The term in brackets depends on the sign of $P_{\Lambda p}$. The unknown parameter $\Lambda_1\Lambda_2$ in the angular distribution must be determined according to $\Lambda_1^2\Lambda_2^2/32\pi^2 \approx e^2/m_\pi^2$ by comparing it with the experiment at one point, but the experimental data were too unreliable for it to be calculated explicitly. The constant Λ_2, which can be found if Λ_1 is known, determines the interaction of $\gamma K^* K$ and stands in a simple relation to the life-time with respect to the $K^* \to K + \gamma$ decay. The present estimate also agrees with the expectation

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Strange particle photoproduction

S/056/62/043/005/051/058
B125/B104

values of the life-time of K^{*}.

ASSOCIATION: Fizicheskiy institut Akademii nauk Armyanskoy SSR (Physics Institute of the Academy of Sciences of the Armyanskaya SSR)

SUBMITTED: June 26, 1962

Card 3/3

L 16680-63 EWT(l)/FCC(w)/BDS AFFTC/ASD/IJP(C)
ACCESSION NR: AP3005275 S/0056/63/045/002/0246/0250

56
55

AUTHOR: Arutyunyan, V. M.; Gol'dman, I. I.; Nagorskiy, G. A.

TITLE: Regge poles for scattering on a Delta potential

SOURCE: Zhur. eksper. i teoret. fiz., v. 45, no. 2, 1963, 246-250

TOPIC TAGS: Regge pole, Delta-function potential, coincidence regression, pole motion

ABSTRACT: The Regge trajectories are investigated for scattering from a delta-function potential, the simplicity of which makes possible a study of details of pole motion such as coincidence recession into the complex plane. Asymptotic pole equations are obtained and the pole motion traced for small and medium positive or negative energies. The point of recession of the poles into the complex plane is established and the direction of their motion away from this point studied. It is concluded that many of the results are valid

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L 16880-63

ACCESSION NR: AP3005275

for an arbitrary potential without singularities at the origin. Orig. art. has 2 figures and 17 formulas.

ASSOCIATION: Fizicheskiy institut GKAE, Yerevan (Physics Inst. State Atomic Energy Commission)

SUBMITTED: 24Jan63 DATE ACQ: 06Sep63 ENCL: 00

SUB CODE: PH NO REF SOV: 004 OTHER: 002

Card 2/2

BAYBURTTSYAN, A.A., prof.; AKOPYAN, V.A.; KAZARYAN, G.A., kand. med. nauk; ARUTYUNYAN, R.R.; NAZINYAN, S.A.; ARUTYUNYAN, V.M.

Radioactive iodine (I^{131}) used in determining the hormonal activity of the thyroid gland in rats following castration. Vop. radiobiol. [AN Arm. SSR] 3/4 225-228 '63. (MIRA 17:6)

KAZARYAN, G.A., kand. med. nauk; ARUTYUNYAN, V.M.; ARUTYUNYAN, R.R.; AKOPYAN, I.G.

Clinical aspects and diagnosis of struma nodosa subjected to malignization. Vop. rent. i onk. 7:311-319 '63 (MIRA 17:7)

ARUTYUNYAN, V.M.; ARUTYUNYAN, F.R.; ESPIRYAN, K.A.; TUMANYAN, V.A.

Light scattering on light. Zhur. eksp. i teor. fiz. 45 no.4: 1270-1272 O '63. (MIRA 16:11)

1. Institut fiziki Gosudarstvennogo komiteta po ispol'zovaniyu atomnoy energii SSSR, Yerevan.

L 45140-65 EEC(b)-2/EPF(c)/EWG(r)/EEC(k)-2/EPA(w)-2/EWA(h)/EWA(k)/EWP(k)/EWT(1)/EWT(m)/EEC(t)/FBD/T/EWA(m)-2 Pf-4/Pi-4/Pl-4/Pn-4/Pn-4/Po-4/Pt-7/Pab-10/Peb SCTB/IJP(c) GG/WW/GS

ACCESSION NR: AT5007929 S/0000/64/000/000/0403/0404

AUTHOR: Arutyunyan, V. M.; Arutyunyan, F. R.; Tapiryan, K. A.; Tumaryan, V. A.

TITLE: Scattering of light on light

SOURCE: International Conference on High Energy Accelerators. Dubna, 1963. Trudy. Moscow, Atomizdat, 1964, 403-404

TOPIC TAGS: high energy accelerator, light scattering, laser, photon scattering

ABSTRACT: Observation and investigation of the rare and very important process of light-light scattering ar possible at present-day intensities of laser emission and bremsstrahlung γ-quanta which are generated by high-energy electrons. According to classical electrodynamics, waves are propagated independently of one another, a direct consequence of the linearity of the Maxwell equations. The quantum effects of interaction of electromagnetic waves with the vacuum of the electron-positron field lead to the nonlinear effect of photon-photon scattering. The theoretical [illegible] the photon effect [illegible] Yavin, 1928-30). For frequencies ω very much less than the electron mass ω≪m, quantum electrodynamics gives for the cross-section in the

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system of the center of inertia the following value

$$d\sigma = \frac{1}{(2\pi)^2}\cdot\frac{139}{64\pi}\alpha^4\frac{1}{m^2}\left(\frac{\omega}{m}\right)^6(3+\cos^2\theta_0)^2,$$

where $\alpha = 1/137$ and θ_0 is the angle of scattering. The units are so chosen that $\hbar = c = 1$. Thus in the optical region of frequencies the cross-section insignificant (around 10^{-64} cm^2), and therefore, regardless of the existence of powerful sources of light photons, the experimental observation of light scattering on light in this region of frequencies is difficult. Since the cross-section rises sharply in magnitude with increasing frequency, the experimental observation of this interesting process must be at high frequencies. In particular, for frequencies of approximately 10^5 ev, the cross-section reaches values around $\sigma \approx 10^{-35}$ cm^2. Such frequencies can be realized in the case of the scattering of γ-quanta of several Gev's on light photons, whose preferable sources are modern lasers. If the energies of the colliding photons in the laboratory system are ω_1 and ω_2, where the first is much greater than the second, then the cross-section of photon-photon scattering which [illegible] of the frequency ω_3 will be

$$\sigma = \frac{\pi}{\pi}\cdot\frac{139}{64\pi}\alpha^4\cdot\frac{1}{m^2}\cdot\frac{\omega_1}{m}\cdot\frac{\omega_2}{m}\cdot\frac{1}{m^2}$$

For $\omega_1 = 6 \cdot 10^9$ ev and $\omega_2 = 1.78$ ev (the photon energy of a ruby laser) the cross-section will be

$$\sigma = 2{,}56 \cdot 10^{-25} \frac{\omega_2}{\omega_1} \text{ cm}^2$$

The frequency of the scattered photon is expressed in terms of the scattering angle in the laboratory system in the following form

$$\omega_3 = \frac{2\omega_1\omega_2}{(\omega_1+\omega_2)-(\omega_1-\omega_2)\cos\theta}$$

It follows from formulas (3) and (4) that the main contribution to the cross-section is given by the scattered photons with high energies; hence, these photons are scattered mainly in the limits of very small angles in the direction of the photon of energy ω_1. For example, in the case of scattered photons registering energies up to $\omega_3 = 500$ Mev, the cross-section is equal to $\sigma = 2.1 \cdot 10^{-36}$ cm^2. The angle within which the scattered photons are emitted increases with decreasing energy, and for $\omega_3 = 500$ Mev it amounts to $1.2 \cdot 10^{-4}$. The present report evaluates the number of registered events that may be obtained using beams of γ-quanta from present-day [illegible] electrons and the [illegible] beams [illegible] the strikes required with energy $\omega_1 = 5$–6 Gev formed by 6-Gev electrons (the number of electrons per impulse of duration 10^{-6} sec amounts to about 10^{11}; the cross-section of the electron beam equals 0.03 cm^2), and photons generated by a 500-Mule

L 46148-65
ACCESSION NR: AT5007929

ruby laser with duration of burst of 10^{-6} sec (the number of photons equals $2 \cdot 10^{21}$), then if the laser is operated with a frequency of 1 cps the frequency of registration of γ-quanta with energy up to $\omega_3 = 500$ Mev will be equal to approximately two to three events each 24 hours. Here the cross-section of the beam of colliding photons is taken to be equal to 1 mm^2 (this is necessary in order to separate the scattered photons from the photons of the same energy of the primary beam). For a [illegible] electron accelerator (Stanford), [illegible] The scattering [illegible] γ-quanta generated by these electrons against a laser photon beam leads to the registration of 10-15 separate photons with energies up to 500 Mev each hour. As computations show, the frequency of observed events in such examples surpasses the possible background noise. There is also a possibility of increasing the number of registered events by increasing the laser emission, the frequency of their operation, the upper limit of the energy of the registered scatter γ-quanta, etc. Orig. art. has 4 formulas.

ASSOCIATION: Fizicheskiy institut GKAE SSSR (Physics Institute, GKAE SSSR)

SUBMITTED: 26May64 ENCL: 00 SUB CODE: OP, NP

NO REF SOV: 001 OTHER: 004

Card 4/4

KAZARYAN, G.A.; ARUTYUNYAN, V.M.; KARAPETYAN, N.V.; CHIL-AKOPYAN, L.A.

Some biochemical indices in thyrotoxicoses. Izv. AN Arm. SSR. Biol. nauki 18 no.1:91-96 Ja '65. (MIRA 18:5)

1. Laboratoriya gormonov i izotopov Nauchno-issledovatel'skogo instituta rentgenologii i onkologii AMN SSSR, endokrinologicheskiy kabinet II meditsinskogo ob"yedineniya.

ARUTYUNYAN, T.M.

Functional state of the thyroid gland in insular apparatus deficiency. Izv. AN Arm. SSR. Biol. nauki 18 no.11:20-25 N '65. (MIRA 19:1)

1. Yerevanskiy meditsinskiy institut. Submitted April 23, 1965.

L 06585-67 EWT(1) GG

ACC NR: AP6029001 SOURCE CODE: UR/0431/66/001/002/0111/0120

AUTHOR: Arutyunyan, V. M.

48
B

ORG: Physics Institute GKAE (Fizicheskiy institut GKAE)

TITLE: Electromagnetic oscillations in a resonance medium

SOURCE: AN ArmSSR. Izvestiya. Fizika, v. 1, no. 2, 1966, 111-120

TOPIC TAGS: electromagnetic wave generation, laser theory, linear differential equation, matrix element, quantum resonance phenomenon

ABSTRACT: The author considers the model problem of radiation of N identical two-level atoms without consideration to pumping and relaxation losses. A matrix element of the transition is considered identical for all atoms and a system of linear differential equations of the first order with constant coefficients is derived which may be solved in certain cases. The contribution of nondiagonal terms was studied by solving the given system on a computer for a medium consisting of 10, 50 and 150 active atoms which are all excited. The results of numerical calculations show that oscillations in photon density are irregular and that this irregularity increases with N. There is some indication that oscillation conditions are never regular for large population inversions. I thank Professor M. L. Ter-Mikayelyan for numerous useful discussions.
Orig. art. has: 1 figure, 32 formulas.

SUB CODE: 20/ SUBM DATE: 04Nov65/ ORIG REF: 002

Card 1/1

ACC NR: AP7005542 SOURCE CODE: UR/0252/66/043/002/0091/0095

AUTHOR: Ter-Mikayelyan, M. L. (Corresponding member AN ArmSSR); Arutyunyan, V. M.

ORG: Physics Institute, Yerevan (Fizicheskiy institut); Joint Radiation Laboratory of the Academy of Sciences of the Armenian SSR and of the Yerevan State University (Ob"yedinennaya radiatsionnaya laboratoriya Akademii nauk Armyanskoy SSR i Yerevanskogo gosudarstvennogo universiteta)

TITLE: Equations of a resonant medium

SOURCE: AN ArmSSR. Doklady, v. 43, no. 2, 1966, 91-95

TOPIC TAGS: resonance scattering, electromagnetic interaction, multipole order, quantum electrodynamics, operator equation, quantum oscillator

ABSTRACT: This is a continuation of earlier work (Vestnik YeGU, no. 2, 1966), where a theory was developed for the passage of electromagnetic radiation through a resonant medium, without concrete assumptions made concerning the multipolarity of the transition. In the present article the authors use averaging of the operator equations of quantum electrodynamics to derive exact quasiclassical equations for a resonant medium. They start from the Hamiltonian for a system of two-level atoms in a radiation field and establish the connection between the vector potential and the transition current by using the rule for differentiating operators in quantum mechanics. The result is an analogy of quasiclassical equations for a resonant medium, but much simpler in form. The final equations coincide with those obtained in an earlier paper for an amplifier.

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ACC NR: AP7005542

A similar procedure can be used to derive the equations for a one-dimensional oscillator. Orig. art. has: 17 formulas.

SUB CODE: 20, 12/SUBM DATE: 00/ ORIG REF: 003

Card 2/2

SOV/110-59-6-16/24

AUTHOR: Arutyunyan, V.S., Engineer

TITLE: A Device for Identifying and Phasing-Out the Stator Windings of a Multi-phase Machine Whose Windings are Coaxial (Ustroystvo dlya markirovki obmotok statora mnogofaznoy mashiny s soosnymi obmotkami)

PERIODICAL: Vestnik elektropromyshlennosti, 1959, Nr 6, pp 65-67 (USSR)

ABSTRACT: Standard series synchronous machines type YeS with mechanical rectifiers, of 5 to 100 kW output, have both main and auxiliary stator windings. The auxiliary stator winding is one of the elements of the field and automatic field-control circuits. A necessary condition of correct operation of the field circuit is that there should be a definite phase angle between the axes of the corresponding phases of the main and auxiliary windings; in machine type YeS this angle should be zero. To identify and phase the windings it is necessary firstly to establish the phase sequence of the main winding; then to arrange the phases of the auxiliary winding so that their axes coincide with the axes of the corresponding phases of the main winding; and finally to locate the start and finish of the auxiliary winding.

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A Device for Identifying and Phasing-Out the Stator Windings of a Multi-phase Machine Whose Windings are Coaxial

At present this work is being done on the machines after assembly but it would be more convenient to do it before the rotor is inserted: the device described in this article was developed for the purpose. With the rotor withdrawn a symmetrical three-phase reduced voltage is applied to the main stator winding. The method of operation of the instrument will be seen from the schematic circuit diagram of Fig 1 and the vector diagram given (without allowance for transformer phase error) in Fig 2. A full connection diagram of the equipment is given in Fig 3 and a photograph of the complete equipment in Fig 4. The phase indicator, photographed in Fig 5, consists of a short-circuited rotor turning in a hollow non-magnetic cylinder. The phase sequence of the main winding governs the direction of rotation of this rotor. In addition to its intended use, the equipment can be applied to the determination of the electrical axes of phases of distributed multi-phase windings of a.c. machines by means of turns

A Device for Identifying and Phasing-Out the Stator Windings of a Multi-phase Machine Whose Windings are Coaxial

inserted into the slots of the winding to be investigated. In testing the device it was found that if the additional and main windings are coaxial the minimum difference between the two voltmeter readings does not exceed 25%. If the angle of displacement between the windings is 15 electrical degrees, the minimum difference between the voltmeter readings is 60%. Thus, the device records differences of 15 electrical degrees which is the minimum angular displacement for machines type YeS with mechanical rectifiers. There are 5 figures.

ARUTYUNYAN, V.S.; TUMANYAN, Ye.G.

At the demonstration machine-tractor station of Armenia. Zashch. rast. ot vred. i bol. 2 no.6:26-28 N-D '57. (MIRA 16:1)

1. Glavnyy agronom Oktemberyanskoy oporno-pokazatel'noy mashinno-traktornoy stantsii (for Arutyunyan). 2. Nachal'nik Gosudarstvennoy inspektsii po karantinu rasteniy po Armyanskoy SSR (for Tumanyan). (Oktemberyan District--Spraying and dusting in agriculture)

ARUTYUNYAN, V.S., insh.

Determination of the mechanical characteristics of machines. (MIRA 15:5)
Vest. elektroprom. 33 no.5:68-69 My '62.
(Electric machinery)

ARUTYUNYAN, V.S., inzh.

Synchronous motor with nonsymmetrical damping system.
Elektrotekhnika 34 no.10:51-56 O '63. (MIRA 16:11)

ARUTYUNYAN, V.S., inzh.

Parameters and asynchronous characteristics of a synchronous machine with a nonsymmetrical damping system. Elektrotekhnika 35 no.6:27-28 Je '64. (MIRA 17:8)

25?25

S/020/61/138/006/001/019
C111/C222

16.3500

AUTHORS: Arutyunyan, Ye.A., Gyul'misaryan, A.G., and Ovsepyan, S.G.

TITLE: Some homogeneous boundary value problems for the string vibration equation

PERIODICAL: Akademiya nauk SSSR. Doklady, v.138, no.6, 1961, 1255-1258

TEXT: In the region D with the boundary the authors consider the problem

$$u_{xx} - \lambda^2 u_{yy} = 0, \qquad (1)$$

$$Lu|_\Gamma = 0, \qquad (3)$$

where the operator L has the form

$$L = \sum_{i+j=0}^{n} c_{ij} \frac{\partial^{i+j}}{\partial x^i \partial y^j}; \qquad (4)$$

here c_{ij} are constants, $c_{00} \neq 0$, and n is a natural number. A number λ for which there exists a function $u_\lambda(x,y)$ satisfying (1),(3), and $Lu_\lambda(x,y) \not\equiv 0$, is called an eigenvalue of (1),(3).

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Theorem 1: Let D be the circle $x^2+y^2 = 1$. Then the eigenfunctions of (1),(3) are complete in $L_2(D)$.

Theorem 2: Let the region D be the circle $x^2+y^2 \leq 1$. Let $c \neq 0,-1,\ldots,-k,\ldots$ Then the eigenvalues of (1) with

$$u|_\Gamma = 0 \qquad (2)$$

are also eigenvalues of (1) with

$$L_1 u|_\Gamma = \left[cu + \frac{\partial u}{\partial n}\right]_\Gamma = 0. \qquad (3^*)$$

The eigenfunctions of (1)-(3*) are complete in D in the class of continuous functions in the sense of the uniform convergence.
An analogous theorem holds for the boundary condition

$$L_1^* u(x,y)|_\Gamma = \sum_{i=0}^{n} c_i \left.\frac{\partial^i u(x,y)}{\partial n^i}\right|_\Gamma = 0 \qquad (n \geq 1),$$

if the expression

$$c_0+kc_1+k(k-1)c_2+\ldots+\frac{k!}{(k-n)!}c_n$$

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25325

Some homogeneous boundary value problems... S/020/61/138/006/001/019
C111/C222

for all k = 0,1,2,... is different from zero.
The authors mention R.A.Aleksandryan whose paper (Ref.2: DAN 73, no.5 (1950)) is essentially used for the proof of the theorems. There are 3 Soviet-bloc references.

ASSOCIATION: Vychislitel'nyy tsentr Akademii nauk Arm SSR (Computing Center of the Academy of Sciences Armyanskaya SSR)

PRESENTED: February 15, 1961, by S.L.Sobolev, Academician

SUBMITTED: December 27, 1960

Card 3/3

ARUTYUNYAN, Ye.M.

X-ray diagnostics of gall bladder congestions. Izv.AN Arm.SSR. Biol. i sel'khoz.nauki. 11 no.12:57-62 D '58. (MIRA 12:2)

1. Institut rentgenologii i onkologii Ministerstva zdravookhraneniya ArmSSR.
(GALL BLADDER--DISEASES) (DIAGNOSIS, RADIOSCOPIC)

ARUTYUNYAN, Ye.M.

Differential diagnosis of calcification of the gallbladder and the biliary tracts. Vop.rent.i onk. 6:77-83 '61. (MIRA 16:2)
(GALLBLADDER—CALCIFICATION) (DIAGNOSIS, DIFFERENTIAL)
(BILIARY TRACT—CALCIFICATION)

ARUTYUNYAN, Ye. S.

"Data on Ingurious Microflora of Zangezur Forests," Iz Ak Nauk Arm SSR, 1950, Vol III, No. 7

SO: MLRA Mikrobiologiya, Vol XX, No. 5, 1951 W-24635.

ARUTYUNYAN, Ye. S.

"Parasitic Microflora of the Oak Forests of Sangezur." Cand Biol Sci, Yerevan State U, Yerevan, 1954. (RZhBiol, No 8, Dec 54)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (12)
SO: Sum. No. 556, 24 Jun 55

ARUTYUNYAN, Ye.S.

Materials on the microflora of oak in the Armenian S. S. R.
Izv. AN Arm. SSR. Biol. nauki 15 no.2:71-80 '62. (MIRA 15:3)

1. Kafedra botaniki Yerevanskogo gosudarstvennogo universiteta.
(ARMENIA—OAK—DISEASES AND PESTS)

ARUTYUNYAN, Yuriy Vartanovich; DANILOV, V.P., otv.red.; KIND, T.B., red.izd-va; DOROKHINA, I.N., tekhn.red.

[Operators of agricultural machinery in the U.S.S.R. from 1929 to 1957; training personnel with broad qualifications] Mekhanizatory sel'skogo khoziaistva SSSR v 1929-1957 gg; formirovanie kadrov massovykh kvalifikatsii. Moskva, Izd-vo Akad.nauk SSSR, 1960. 339 p. (MIRA 13:3)

(Farm mechanization)

KIM, M.P., glav. red.; ARUTYUNYAN, Yu.V., red.; GUSEV, K.V., red.; DANILOV, V.P., red.p SHARAPOV, G.V., red.; IVANOVA, R.S., red.; KACHURINA, A.V., red.; RATNER, V.I., red.; NAUMOV, K.M., tekhn. red.

[Alliance between the working class and peasantry at the present-day stage]Soiuz rabochego klassa i krest'ianstva na sovremennom etape. Moskva, Izd-vo VPSh i AON, 1962. 358 p. (MIRA 15:9)

1. Moscow. Akademiya obshchestvennykh nauk.
(Agricultural policy)

KOROL', A.N.; Prinimali uchastiye: ARUTYUNYAN, Z.; SHESHENIN, V.

Gas chromatography of lower fatty acids. Khim. i tekh. topl. i masel 8 no.7:62-64 Jl '63. (MIRA 16:7)

1. Nauchno-issledovatel'skiy institut avtomatizatsii proizvodstvennykh protsessov khimicheskoy promyshlennosti i tsvetnoy metallurgii.
(Acids, Fatty) (Gas chromatography)

ARUTYUNYANTS, A.

ARUTYUNYANTS, A.S., kandidat tekhnicheskikh nauk; KANAYEV, V., inzhener.

Solid oil injector with electric drive. Avt.transp. 34 no.4: 17-18 Ap '56. (ML RA 9:8)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut avtomobil'nogo transporta.

(Automobiles--Lubrication)

ARUTYUNYANTS, A.O., starshiy nauchnyy sotrudnik; KOGAN, F.L., tekhnicheskiy redaktor

[Machinery for lubricating automobiles] Oborudovanie dlia smazki avtomobilei. Moskva, Nauchno-tekhn.izd-vo avtotransp.lit-ry, 1957. 100 p. (MIRA 10:10)

1. Moscow. Nauchno-issledovatel'skiy institut avtomobil'nogo transporta.
(Automobiles--Lubrication)
(Garages--Equipment and supplies)

TER-KARAPET'YANTS, N. N., vrach (seleniye Sos, Azerbaydzhanskaya SSR); ARUTYUNYANTS, A. T., fel'dsher (seleniye Sos, Azerbaydzhanskaya SSR)

Two cases of stable healing of trophic ulcers of the lower extremities. Fel'd. i akush. 27 no.5:49-50 My '62. (MIRA 15:7)

(EXTREMITIES, LOWER--ULCERS)

ARUTYUNYANTS, L. N. PHYSICIAN Dr. Med Sci.

Dissertation: "Clinical Observation and the Origin of Wartime Psychoses in Cases of Extracranial Wounds." Second Moscow State Medical Inst. imeni I. V. Stalin 8 Dec 47.

SO: Vechernyaya Moskva, Dec, 1947 (Project #17836)

TKACHUK, V.G., doktor geologo-mineralog. nauk; TOLSTIKHIN, N.I., prof.; PINNEKER, Ye.V., kand. geologo-mineralog. nauk, mladshiy nauchnyy sotr.; YASNITSKAYA, N.V., mladshiy nauchnyy sotr., khimik; KRUTIKOVA, A.I., mladshiy nauchnyy sotr., khimik; SHOTSKIY, V.P., kand. geogr. nauk; ORLOVA, L.M., starshiy gidrogeolog; STEPANOV, V.M., kand. geologo-mineralog. nauk; VLASOV, N.A., kand. khim. nauk; PROKOP'YEV, B.V., kand. khim. nauk; CHERNYSHEV, L.A., starshiy prepodavatel'; PAVLOVA, L.I., starshiy prepodavatel'; Prinimali uchastiye: IVANOV, V.V., kand. geologo-mineralog. nauk; YAROTSKIY, L.A., kand. geologo-mineralog. nauk; KARASEVA, A.P., nauchnyy sotr.; ARUTYUNYANTS, R.R., nauchnyy sotr.; ROMANOVA, E.M., nauchnyy sotr.; TROFIMUK, P.I., starshiy gidrogeolog; LADEYSHCHIKOV, P.I., starshiy nauchnyy sotr., kand. geogr. nauk; LYSAK, S.V., starshiy laborant; KRUCHININA, L.Yu., laborant; SEMENOVA, Ye.A., red. izd-va; BOCHEVER, V.T., tekhn. red.

[Mineral waters of the southern part of Eastern Siberia] Mineral'nye vody iuzhnoi chasti Vostochnoi Sibiri. Moskva. Vol.1. [Hydrogeology of mineral waters and their significance for the national economy] Gidrogeologiia mineral'nykh vod i ikh narodnokhoziaistvennoe znachenie. Pod obshchei red. V.G.Tkachuk i N.I.Tolstikhina. 1961. 346 p. (MIRA 14:8)

1. Akademiya nauk SSSR. Sibirskoye otdeleniye. Vostochno-sibirskiy geologicheskiy institut.

(Continued on next card)

TKACHUK, V.G.--- (continued) Card 2.

2. Vostochno-Sibirskiy geologicheskiy institut (for Tkachuk, Pinneker, Yasnitskaya, Krutikova, Lysak). 3. Institut geografii Sibirskogo otdeleniya Akademii nauk SSSR (for Shotskiy). 4. Chitinskoye geologicheskoye upravleniye (for Orlova). 5. Sosnovskaya ekspeditsiya Ministerstva geologii i okhrany nedr SSSR (for Stepanov). 6. Irkutskiy gosudarstvennyy universitet (for Vlasov, Prokop'yev, Chernyshev, Pavlova). 7. Leningradskiy gornyy institut (Tolstikhin). 8. Gosudarstvennyy nauchno-issledovatel'skiy institut kurortologii i fizioterapii (for Ivanov, Yarotskiy, Karaseva, Arutyunyants, Romanova). 9. Irkutskoye geologicheskoye upravleniye (for Trofimuk). 10. Baykal'skaya limnologicheskaya stantsiya Vostochno-Sibirskogo filiala AN SSSR (for Ladeyshchikov). 11. Otdel ekonomiki i geografii Vostochno-Sibirskogo filiala AN SSSR (for Kruchinina).

(Siberia, Eastern--Mineral waters)

IBADULLAYEV, F.I.; ARUTYUNYANTS, S.I.

Removing Trichodesma incana seeds from forage grain.
Veterinariia 42 no.11:89-91 N '65.
(MIRA 19:1)

1. Uzbekskiy nauchno-issledovatel'skiy veterinarnyy institut.

ARUTYUNYANTS, V. D. Chair Med Soi -- "Blood vessels in myocardial infarction and dynamics of the vascularization of the ~~heart~~ cardiac scar. (Anatomical X-ray and histological study)." Mos, 1961 (Acad Med Soi USSR). (KL, 4-61, 207)

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ARTYUSHOV, Veniamin Pavlovich; MIKHAYLOV, I.P., nauchn. red.; SHAKHNOVA, V.M., red.

[Automatic gas cutting in shipbuilding] Opyt avtomaticheskoi gazovoi rezki v sudostroenii. [zd.2., ispr i dop. Leningrad, Sudostroenie, 1965. 127 p. (MIRA 19:1)

ARUZOVA, I.A.; YEFREMOVA, V.N.

Polymerization of glycidyl methacrylate. Vysokom soed. 1 no.3:455-459 Mr '59. (MIRA 12:10)

1.Institut vysokomolekulyarnykh soyedineniy AN SSSR.
(Polymerization) (Methacrylic acid)

ARVA, Gyorgy, dr.

John Ambroise Fleming. Ujit lap 17 no.7:2 13 Ap '65.

ARVA, Gyorgy, dr.

Jean Baptiste Joseph Fourier. Ujit lap 12 no.15:2 My '60.

(Fourier, Jean Baptiste Joseph)
(Fourier's series)

ARVA, Gyorgy, dr.

A calendar of inventors; the originator of the Hungarian district heating. Ujit lap 12 no.29:2 S '60.

(Hungary—Heating from central stations)
(Galocsy, Arpad)

ARVA, Gyorgy, dr.

Andre Marie Ampere. Ujit lap 17 no.2:2 25 Ja '65.

ARVA, Gyorgy, dr.

Father of "Hungaram." Ujit lap 13 no.2:2 Ja '61.

(Hungary--Electric lamps, Incandescent)
(Hanaman, Ferenc)

ARVA, Gyorgy, dr.

Marton Debreczeni. Ujit lap 13 no.3:2 F '61.

(Debreczeni, Marton)
(Engineers, Hungarian)

ARVA, Gyorgy, dr.

A many-sided Hungarian innovator; commemoration of Miklos Konkoly-Thege on the 45th anniversary of his death. Ujit lap 13 no.4:2 of cover F '61.

(Konkoly-Thege, Miklos)
(Hungary—Observatories)

ARVA, Gyorgy, dr.

A versatile Hungarian innovator; remembering Miklos Konkoly-Thege on 45h anniversary of his passing away. Ujit lap 13 no.4:2 F '61.

(Konkoly-Thege, Miklos)
(Scientists, Hungarian)

ARVA, Gyorgy, dr.

The pioneer of the Hungarian silk manufacturing. Ujit lap 13 no.8:2 Ap '61.

ARVA, Gyorgy, dr.

"Father of railroads". Ujit lap 13 no.10:2 My '61.

(Railroads) (Stephenson, George)

ARVA, Gyorgy, dr.

Gottfried Wilhelm Leibniz. Ujit lap 13 no.11:2 Je '61.

(Leibniz, Gottfried Wilhelm)
(Mathematicians, German)

ARVA, Gyorgy, dr.

The man who laid down the foundation stone of the atomic age.
Ujit lap 13 no.13:2 Jl '61.

(Avogadro, Count Amadeo)
(Nuclear physics)

ARVA, Gyorgy, dr.

The creator of the airplane. Ujit lap 13 no.14:2 Jl '61.

(Airplanes) (Wright, Wilbur) (Wright, Orville)

ARVA, Gyorgy, dr.

Michel Eugene Chevreul. Ujit lap 13 no.15:2 Ag '61.

(Chevreul, Michel Eugene)
(Chemists, French)

ARVA, Gyorgy, dr.

John Dalton. Ujit lap 13 no.16:2 Ag '61.

(Dalton, John)
(Scientists, English)

ARVA, Gyorgy, dr.

Jozsef Petzval. Ujit lap 13 no.17:2 S '61.

(Petzval, Jozsef)
(Scientists, Hungarian)

ARVA, Gyorgy, dr.

Joseph Antoine Ferdinand Plateau. Ujit lap 13 no.19:2 O '61.

(Plateau, Joseph Antoine Ferdinand)
(Scientists, Belgian)